

IN THE CLAIMS

Please amend the claims as described below. In accordance with 37 CFR §1.121, a complete listing of all claims in the application is provided below. Notably, the status of each claim is indicated in the parenthetical expression adjacent to the corresponding claim number.

Claims 1 - 50 (Canceled).

1 **Claim 51 (Currently Amended):** An EIW unit for use in sensing a process
2 parameter of a process to manufacture an integrated circuit using integrated circuit
3 processing equipment, the EIW unit comprising:

4 a substrate having a wafer-shaped profile;

5 a plurality of light sources, disposed on or in the substrate, to output light to permit
6 sampling of sample a process parameter of the process performed by the integrated circuit
7 processing equipment; and

8 a predetermined surface layer disposed above the plurality of light sources and
9 capable of receiving a surface structure thereon, wherein the surface structure is formed by
10 the integrated circuit processing equipment during processing.

1 **Claim 52 (Previously Presented):** The EIW unit of claim 51 wherein the
2 predetermined surface layer is patterned to guide or shape the light output by the plurality
3 of light sources.

1 **Claim 53 (Previously Presented):** The EIW unit of claim 51 wherein the
2 predetermined surface layer includes a grating structure.

1 **Claim 54 (Previously Presented):** The EIW unit of claim 53 wherein the refractive
2 index of the grating structure is capable of being changed dynamically.

1 **Claim 55 (Currently Amended):** The EIW unit of claim 53 54 wherein the EIW unit
2 further includes an acoustic modulation module disposed in or on the substrate to control
3 the refractive index of the grating structure.

1 **Claim 56 (Previously Presented):** The EIW unit of claim 51 wherein the plurality of
2 light sources operates in an end-point mode.

1 **Claim 57 (Previously Presented):** The EIW unit of claim 51 wherein the plurality of
2 light sources operates in a real-time mode.

1 **Claim 58 (Previously Presented):** The EIW unit of claim 51 wherein
2 predetermined surface layer includes a plurality of layers.

1 **Claim 59 (Currently Amended):** The EIW unit of claim 58 wherein the plurality of
2 layers includes ~~is comprised of~~ a composite dielectric structure.

1 **Claim 60 (Previously Presented):** The EIW unit of claim 51 wherein the plurality of
2 light sources output light at different wavelengths.

1 **Claim 61 (Previously Presented):** The EIW unit of claim 60 further including a
2 plurality of light sensors, disposed in or on the substrate wherein the light sensors sample
3 light that is reflected or scattered by the surface structure formed by the integrated circuit
4 processing equipment during processing.

1 **Claim 62 (Previously Presented):** The EIW unit of claim 51 wherein the intensity
2 of the light output by the plurality of light sources may be varied or modulated.

1 **Claim 63 (Previously Presented):** The EIW unit of claim 51 wherein the intensity
2 of the light output of a first light source of the plurality of light sources may be varied or
3 modulated relative to another light source of the plurality of light sources.

1 **Claim 64 (Previously Presented):** The EIW unit of claim 51 wherein the plurality of
2 light sources is VCSELs or LEDs.

1 **Claim 65 (Previously Presented):** The EIW unit of claim 51 further including a
2 plurality of light sensors, disposed in or on the substrate, wherein the light sensors sample
3 light that is reflected or scattered by the surface structure.

1 **Claim 66 (Previously Presented):** The EIW unit of claim 65 wherein the plurality of
2 light sensors are CMOS devices, charge coupled devices, or photodiodes.

1 **Claim 67 (Previously Presented):** The EIW unit of claim 65 wherein the plurality of
2 light sensors periodically or continuously sample the intensity of the light while the EIW unit
3 is disposed in the integrated circuit processing equipment and undergoing processing.

1 **Claim 68 (Previously Presented):** The EIW unit of claim 67 further including data
2 storage, coupled to the plurality of light sensors, to store data which is representative of the
3 parameter.

1 **Claim 69 (Previously Presented):** The EIW unit of claim 67 further including:
2 communication circuitry to provide the data which is representative of the parameter
3 to external circuitry; and
4 at least one rechargeable battery, to provide electrical power to the communication
5 circuitry.

1 **Claim 70 (Previously Presented):** The EIW unit of claim 67 wherein the plurality of
2 light sensors sample the intensity of reflected or scattered light.

1 **Claim 71 (Previously Presented):** A method of measuring a process parameter of
2 an integrated circuit manufacturing process using an EIW unit having a substrate, which
3 includes a wafer-shaped profile, a plurality of light sources disposed on or in the substrate,
4 and a predetermined surface layer disposed above the plurality of light sources, the method
5 comprising:
6 placing the substrate into the integrated circuit processing equipment;

7 performing the integrated circuit manufacturing process wherein a surface structure
8 forms on or in the predetermined surface layer during the manufacturing process;
9 enabling the plurality of light sources to output light;
10 sampling the response to the light output by the plurality of light sources; and
11 determining the process parameter using the sampled response.

1 Claim 72 (**Previously Presented**): The method of claim 71 further including
2 changing the refractive index of the predetermined surface layer.

1 Claim 73 (**Previously Presented**): The method of claim 71 further including
2 dynamically changing the refractive index of the predetermined surface layer while
3 performing the integrated circuit manufacturing process.

1 Claim 74 (**Previously Presented**): The method of claim 71 wherein the response
2 to the light output by the plurality of light sources is sampled after performing the integrated
3 circuit manufacturing process.

1 Claim 75 (**Previously Presented**): The method of claim 71 wherein the response
2 to the light output by the plurality of light sources is sampled while performing the integrated
3 circuit manufacturing process.

1 Claim 76 (**Previously Presented**): The method of claim 71 wherein the plurality of
2 light sources output light at different wavelengths.

1 **Claim 77 (Previously Presented):** The method of claim 71 wherein the EIW unit
2 further includes a plurality of light sensors, disposed in or on the substrate, and wherein the
3 plurality of light sensors sample the response to the light output by the plurality of light
4 sources.

1 **Claim 78 (currently amended):** The method of claim 71 wherein ~~further including~~
2 sampling the response to the light output by the plurality of light sources includes sampling
3 the light that is reflected or scattered by the surface structure formed by the integrated
4 circuit processing equipment during processing.

1 **Claim 79 (Previously Presented):** The method of claim 71 further including varying
2 the intensity of the light output by the plurality of light sources.

1 **Claim 80 (Previously Presented):** The method of claim 71 further including varying
2 the intensity of the light output of a first light source of the plurality of light sources relative
3 to another light source of the plurality of light sources.

1 **Claim 81 (Previously Presented):** The method of claim 71 wherein the EIW unit
2 further includes a plurality of light sensors, disposed in or on the substrate, and wherein the
3 plurality of light sensors periodically or continuously sample the response to the light output
4 by the plurality of light sources while performing the integrated circuit manufacturing
5 process.

1 **Claim 82 (Previously Presented):** The method of claim 81 wherein the EIW unit
2 further includes a data storage, disposed in or on the substrate, and wherein the method
3 further includes storing the response to the light output by the plurality of light sources in
4 the data storage.

1 **Claim 83 (Previously Presented):** The method of claim 81 wherein the EIW unit
2 further includes communication circuitry, disposed in or on the substrate, and wherein the
3 method further includes communicating the response to the light output by the plurality of
4 light sources.

1 **Claim 84 (Previously Presented):** The method of claim 71 further including
2 sampling the intensity of the reflected or scattered light using a plurality of light sensors.

1 **Claim 85 (Previously Presented):** The method of claim 84 wherein the plurality of
2 light sensors is disposed on or in the substrate of the EIW unit.

1 **Claim 86 (Previously Presented):** The method of claim 85 further including varying
2 the intensity of the light output by the plurality of light sources.

1 **Claim 87 (Previously Presented):** The method of claim 85 further including varying
2 the intensity of the light output of a first light source of the plurality of light sources relative
3 to another light source of the plurality of light sources.

1 Claim 88 (**Previously Presented**): The method of claim 85 further including
2 periodically or continuously sampling the response to the light output by the plurality of light
3 sources while performing the integrated circuit manufacturing process.

1 Claim 89 (**Previously Presented**): The method of claim 85 further including
2 sampling the response to the light output by the plurality of light sources after performing
3 the integrated circuit manufacturing process.

1 Claim 90 (**Previously Presented**): The method of claim 85 further including
2 changing the refractive index of the predetermined surface layer.

1 Claim 91 (**Previously Presented**): The method of claim 85 further including
2 dynamically changing the refractive index of the predetermined surface layer while
3 performing the integrated circuit manufacturing process.

1 Claim 92 (**Previously Presented**): The method of claim 71 wherein the process
2 parameter is a thickness of the surface structure.

1 Claim 93 (**Previously Presented**): The method of claim 71 wherein the process
2 parameter is a spatial distribution of a surface structure.

1 Claim 94 (**Previously Presented**): A system for sensing process parameters of a
2 process for manufacturing an integrated circuit using integrated circuit processing

3 equipment, the system comprising:
4 an EIW unit, including:
5 substrate having a wafer-shaped profile; and
6 a source, disposed on or in the substrate, to output interrogation signals;
7 a sensor to sample the interrogation signals while or after the EIW unit is subjected
8 to processing by the integrated circuit processing equipment; and
9 a computing device to receive the sampled interrogation signals from the sensor and
10 determine the process parameter using the sampled interrogation signals.

1 Claim 95 (**Previously Presented**): The system of claim 94 wherein the source is a
2 VCSEL or LED.

1 Claim 96 (**Previously Presented**): The system of claim 95 wherein the sensor is a
2 CMOS device, charge coupled device, or photodiode.

1 Claim 97 (**Previously Presented**): The system of claim 94 wherein the process
2 parameter is the surface profile.

1 Claim 98 (**Previously Presented**): The system of claim 94 wherein the sensor is
2 disposed on or in the substrate.

1 Claim 99 (**Previously Presented**): The system of claim 98 further including
2 communications circuitry disposed on the substrate, wherein the communications circuitry

3 is coupled to the sensor to provide the sampled interrogation signals to the computing
4 device.

1 Claim 100 (**Previously Presented**): The system of claim 94 wherein the sensor
2 operates in an end-point mode.

1 Claim 101 (**Previously Presented**): The system of claim 94 wherein the sensor
2 operates in a real-time mode.

1 Claim 102 (**Previously Presented**): The system of claim 94 wherein the EIW unit
2 further includes a predetermined surface layer disposed above the source, and wherein the
3 source is a plurality of light sources that output light at different wavelengths.

1 Claim 103 (**Previously Presented**): The system of claim 102 wherein the sensor is
2 a plurality of light sensors wherein the light sensors sample light that is reflected or
3 scattered by a surface structure formed by the integrated circuit processing equipment
4 during processing.

1 Claim 104 (**Previously Presented**): The system of claim 103 wherein the plurality
2 of light sensors is disposed in or on the substrate.

1 **Claim 105 (Previously Presented):** The system of claim 103 wherein the
2 predetermined surface layer is patterned to guide or shape the light output by the plurality
3 of light sources.

1 **Claim 106 (Previously Presented):** The system of claim 103 wherein the
2 predetermined surface layer includes a grating structure.

1 **Claim 107 (Previously Presented):** The system of claim 106 wherein the refractive
2 index of the grating structure is capable of being changed dynamically.

3 **Claim 108 (Previously Presented):** The system of claim 106 wherein the EIW unit
4 further includes an acoustic modulation module disposed in or on the substrate to control
5 the refractive index of the grating structure.

1 **Claim 109 (Previously Presented):** The system of claim 102 wherein the sensor
2 and source operate in an end-point mode.

1 **Claim 110 (Previously Presented):** The system of claim 102 wherein the sensor
2 and source operate in a real-time mode.

1 **Claim 111 (Previously Presented):** The system of claim 102 wherein predetermined
2 surface layer includes a plurality of layers.

1 Claim 112 **(Currently Amended)**: The system of claim 111 ~~402~~ wherein the
2 plurality of layers ~~is comprised of~~ includes a composite dielectric structure.

1 Claim 113 **(Previously Presented)**: The system of claim 102 wherein the intensity
2 of the light output by the plurality of light sources may be varied or modulated.

1 Claim 114 **(Previously Presented)**: The system of claim 102 wherein the intensity
2 of the light output of a first light source of the plurality of light sources may be varied or
3 modulated relative to another light source of the plurality of light sources.

1 Claim 115 **(Previously Presented)**: The system of claim 94 wherein the computing
2 device determines the thickness of a surface layer formed by the integrated circuit
3 processing equipment during processing.

1 Claim 116 **(Previously Presented)**: The system of claim 94 wherein the computing
2 device determines the spatial distribution of a surface layer formed by the integrated circuit
3 processing equipment during processing.